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## THE VARIABLE COST OF AN OPERATING ROOM MINUTE FOR VALVULAR PROCEDURES

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**OBJECTIVES:** Few studies have attempted to quantify the costs of operating room (OR) time. The purpose of this study is to quantify the variable cost per OR minute in isolated non-robotic valvular procedures – aortic valve replacement (AVR), mitral valve replacement (MVR), and mitral valve repair (MVRepair). **METHODS:** The Premier database, one of the most comprehensive hospital databases, was queried from 2007 to 2011 for patients undergoing AVR, MVR, or MVRepair. This database contains complete billing, hospital cost, and coding data from >600 US facilities. Patients were identified using the following International Classification of Diseases 9th Revision (ICD-9) procedure codes: AVR 35.21, 35.22; MVR 35.23, 35.24; and MVRepair 35.12. Patients having coronary artery bypass grafting were excluded. The surgical approaches, right thoracotomy (RT) and any sternal incision, were identified for each patient with expert clinical assistance. Patients with right thoracotomy were then propensity score matched to patients with any sternal incision, adjusting for patient differences. Premier classified variable costs of the OR into three categories; staff for the surgery room, anesthesia, and recovery room. Outliers were identified based on the cost per minute of the procedure. The top and bottom five percent were removed. All costs were adjusted to 2012 dollars using the Medical Care Component of the Consumer Price Index. **RESULTS:** There were 2,657 valvular procedures - 1,604 AVR, 434 MVR, and 619 MVRepair - that met the inclusion criteria. The average cost per OR minute was $28.5 (95% CI $28.1 - $28.9) for all procedures, and $27.8 (95% CI $27.3 – $28.3), $31.7 (95% CI $29.5 - $31.9), $28.7 (95% CI $27.9 - $29.5) for AVR, MVR, and MVRepair, respectively. **CONCLUSIONS:** Quantifying the variable cost of an OR minute from a multi-institution database provides researchers with an important component to use in economic evaluations for valvular procedures.

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## COMPARISON OF ANNUAL COST AND RESOURCE UTILIZATION FOR HEART FAILURE PATIENTS IN SOUTH KOREA: BETWEEN 2009 AND 2011

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**OBJECTIVES:** The purpose of this study was to find the trends in total medical expenditure and utilization patterns of medical resource for heart failure inpatients between years of 2009 and 2011. **METHODS:** Heart failure patient was defined as the one with I50, which is the primary diagnosis ICD-10 code. Patients were identified from the Korea National Health Insurance Claim's Sample data in Health Insurance Review & Assessment Service (HIRA_NIS data) of 2009 (Serial Number: HIRA_NPS_2009-0071) and 2011 (Serial Number: HIRA_NIS_2011-0067). The HIRA_NIS data contain 13% of overall inpatient and 1% of ambulatory patient data including medical costs and resource utilizations of the patients in Korea (about 1.1 million persons per year). The estimated number of total researched patients were 7,410 in 2009, comprised of 2,571 inpatients and 6,010 outpatients. In 2011, the estimated number of patients were 8,557; 2,803 inpatients and 7,189 outpatients. **RESULTS:** The average medical expenditure per inpatient with heart failure had increased to 14.9% between two years. For all types of hospitals studied, university hospital, general hospital, and secondary hospital, the medical cost per inpatient had increased. The length of hospitalization had increased to 8.4% in 2011 compared with 2009. In both years, essential hypertension and arterial fibrillation & flutter were the most prevalent secondary diseases for heart failure inpatients, followed by non-insulin-dependent diabetes mellitus in 2009 and angina pectoris in 2011. **CONCLUSIONS:** Heart failure was a serious disease in terms of the medical expenditure for treatment and the length of hospitalization in both years. The medical expenditure was increasing with time. Considering this trend, it can be expected that the economic burden for patients, hospitals, and the health care system will continuously be increased.

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## THE PREVALENCE AND HEALTH CARE EXPENDITURES ASSOCIATED WITH ANTIHYPERLIPIDEMIC DRUGS

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**OBJECTIVES:** High cholesterol is one of the major risk factors for coronary heart disease. The objectives of this study were to examine the prevalence of antihyperlipidemic agents use, and provide estimates of the associated outpatient prescription drug utilization and expenditure. **METHODS:** A cross-sectional study was conducted using data from the Medical Expenditure Panel Survey (MEPS) between 2002 and 2010. Subjects were derived from U.S. civilian and non-institutionalized population diagnosed with hyperlipidemia. A series of descriptive analyses were performed to estimate the weighted prevalence, utilization, and expenditures for the hyperlipidemic patients who received any FDA-approved lipid lowering agent. SAS 9.3 statistical software was used for all analyses including sample weights and standard error adjustments. **RESULTS:** The study findings indicated the patients diagnosed with hyperlipidemia increased from 17 million to 41 million between 2002 and 2010. Among these, 94.1% in 2002 vs. 87.8% in 2010 of the patients received antilipidemic drugs. However, the utilization of total lipid lowering agents increased from 96 million in 2002; to 149 million in 2005; then to 231 million in 2010. The drug expenditures showed a significant increase by $12 billion rising from $11.7 billion in 2002 to $22.8 billion in 2010. **CONCLUSIONS:** Despite the prevalence of a noted increase of treatment, utilization and expenditures for those diagnosed with hyperlipidemia, there exists a large population of people who remain untreated. The study results indicate that further research is needed to improve treatment of hyperlipidemia as well as assessing the impact on costs and health care outcomes from untreated patients over time.

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## COSTS OF ACUTE HEART FAILURE IN SOUTH KOREA

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**OBJECTIVES:** The purpose of this study was to find the total medical expenditure and utilization of trends in medical resource for patients hospitalized and diagnosed with heart failure. **METHODS:** : Heart failure patients were identified from the Korean HIRA_NIS Data (National Health Insurance Claims' Sample data) of 2011, provided by Health Insurance Review & Assessment Service (HIRA) in South Korea. Heart failure inpatient was defined as the one whose primary diagnosis ICD-10 code is I50. The analysis of relations between total medical expenditure and possible variables are processed through regression analysis. **RESULTS:** The average medical cost per inpatient with heart failure was KRW 3,167,969 (USD 2,970.16). The medical cost per inpatient showed KRW 3,627,711 (USD 3,401.19) KRW 2,500,556 (USD 2,344.42) KRW 1,668,074 (USD 1,563.92) in the university hospitals, general hospitals, and secondary hospitals, respectively. The number of visit to hospital for each patient was 1.7 times per year. The average hospital stay for inpatient was 24.6 days. The essential hypertension, arterial fibrillation and flutter, and angina pectoris were ranked to be the most prevalent secondary disease for heart failure in-patients. According to the result of multivariate regression analysis, with observation of 8,557 heart failure inpatients, factors including the age of 40 and over, male, visit days and renal impairment showed a significant increase in total medical expenditure. Especially, renal impairment was the largest impact on the increase in treatment cost of heart failure (coefficient=2,831,614 SD 123,951, $p<0.001$). **CONCLUSIONS:** Although extra billing cost could not be identified with NHI claims data, this analysis suggests that heart failure is a considerable disease with great medical expenditure. In consideration of total medical expenditure, it can be expected that patients, hospitals, and national health care department are currently in severe economic burden.

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## THE DAVIRAD STUDY: EVALUATION OF ECONOMIC AND MEDICAL CONSEQUENCES OF LEFT VENTRICULAR ASSISTED DEVICE IN SEVERE HEART FAILURE IN FRANCE

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**OBJECTIVES:** Advanced heart failure (HF) is a leading cause of death in developed countries. One to two percent of the French population is affected by this disease. It also causes a substantial economic burden on society and cost 1.6 billion euros per year in France. Usually, cardiac transplantation is the most effective treatment. However, because of a limited donor organ supply, innovative technics as left ventricular assist devices (LVAD) were developed for over 10 years. This study aims to assess the medical and economic consequences of LVAD in adults with advanced HF in France during one year after LVAD implantation. **METHODS:** The primary medical outcome was the discharge to the patient's home. Secondary medical outcomes were defined as final situation of patient, survival, dependence and quality of life (QOL) assessed with the SF-36 and the Minnesota QOL questionnaires. This prospective economic analysis adopted the health care payer's perspective and took into account direct medical and non-medical costs. **RESULTS:** Among the 55 patients included, 37 were discharged at home during an average of 140 days. At one year, 23 patients were still on device and spent 238 days at home, 15 were transplanted and spent 132 days at home and 17 were died and spent 13 days at home. The mean total cost per implanted patient was 164,154±37,104€. Costs drivers were the device (58%) and initial hospitalization (30%). The cost of at home care was 6,084±6,738€ accounting for only 4% of total cost. According to the health care payer's perspective, one day spent at home costs 44€. Survival, QOL and dependence analyses are being processed. **CONCLUSIONS:** Continuous- flows LVAD represent a costly strategy in the HF treatment but allow the patient to be discharged at home instead of awaiting heart transplantation at hospital.

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## INTRA-HOSPITAL COST OF IMPLANTING A LEFT VENTRICULAR ASSISTANCE DEVICE: A CANADIAN PERSPECTIVE

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**OBJECTIVES:** To identify the total in-hospital cost associated with the index hospitalization for the implantation of a left ventricular assistance device (LVAD) in a Quebec, Canada setting. **METHODS:** A retrospective patient chart review was conducted in all 3 hospital centers with an active LVAD program to identify all patients who underwent LVAD implantation between January 1st 2010 and December 31st2013. The costing evaluation had 4 distinct components: 1) LVAD acquisition cost; 2) implantation procedure cost; 3) hospital stay cost; and 4) inpatient drug costs. The average cost per patient was calculated. All costs were actualized to 2013 $CDN values. **RESULTS:** A total 65 LVAD-implanted patients were identified between 2010 and 2013. The majority of these patients were male (n=49 [75.4%]) and the average was 52.2 years old (SD 14.2). Patient-specific costing was completed for 17 of these patients. Average index hospitalization stay was 64 days (range 11-140). Average per patient cost was $157,073 (range $115,911-222,933). **CONCLUSIONS:** This is the first province-wide evaluation of the cost of the index hospitalisation for LVAD implantation. These results should inform the decision-making process related to future resource allocation for the province's LVAD program.